



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|-----------------------|
| 10/661,476 | 09/15/2003 | Marc Ferrato | Q77425 | 9244 |
| 23373 | 7590 | 01/06/2005 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | | BAREFORD, KATHERINE A |
| ART UNIT | | PAPER NUMBER | | |
| | | 1762 | | |

DATE MAILED: 01/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/661,476 | FERRATO ET AL. | |
| | Examiner | Art Unit | |
| | Katherine A. Bareford | 1762 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-10 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-10 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 9/03.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 3 and 4, "high" in reference to the "temperature" and "speed" is vague and indefinite as to what range of temperatures or speeds is encompassed by the term.

Claim 4, line 5, after "solvent" applicant should add a phrase such as "to form a solution" so as to provide antecedent basis for "said solution" in line 6.

Claim 4, line 7, after "agitation" applicant should add a phrase such as "to form a suspension" so as to provide antecedent basis for "said suspension" in line 8.

Claim 4, line 9, "said granulated powder" lacks antecedent basis, as previously simply "a powder" was referred to.

Claim 7, line 4, did applicant mean to claim "propanol" or "isopropanol" as at page 4, line 10 of the specification.

Claim 10, line 4, "low" in reference to the "temperature" is vague and indefinite as to what range of temperatures is encompassed by the term.

The other dependent claims do not cure the defects of the claims from which they depend.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultze et al (US 4460529) in view of Knudsen et al (US 5273699).

Schultze teaches a method of fabricating a substrate that can be an aluminum nitride substrate. Column 1, lines 60-68 and column 2, lines 40-55. The substrate is obtained by spraying a powder onto a support at a high temperature and a high speed. Column 2, line 40 through column 3, line 40 (the plasma spraying would provide "high" temperature and speed, as shown by claim 2). The powder can include AlN grains. Column 2, lines 40-55. Schultze

teaches that the process can replace conventional processes such as dry pressing, wet extrusion, slip molding, isostatic pressing, hot pressing, and injection pressing, whereby a ceramic powder is processed and then undergoes high temperature sintering. Column 1, lines 15-35.

Claim 2: the powder can be sprayed by a plasma torch (plasma spraying). Column 3, lines 15-30.

Claim 8: the substrate can be obtained by providing a plurality of passes over the support as a function of the required thickness. Column 5, lines 20-30.

Claim 10: the substrate can be heated after spraying, thus providing the "annealing". Column 4, lines 55-60. Note the 35 USC 112 rejection above, as to the confusion as to what is required by "low" temperature.

Schultze teaches all the features of these claims except (1) the use of the oxide precursor, (2) spraying with an oxyacetylene torch (claim 3), (3) the specific formation of the powder and the materials used (claims 4-7).

Abstract

However, Knudsen teaches a method of forming an aluminum nitride powder. Knudsen teaches that it is desirable to make the powder moisture resistant by treating with a yttrium containing compound, thus preventing storage problems for the powder. Column 2, lines 5-20 and 35-45. The yttrium compound can be an rare earth oxide precursor, such as yttrium isopropoxide. Column 3, lines 10-20. The compound can be applied to the aluminum nitride powder by (1) dissolving the yttrium compound in an organic solvent forming a solution, (2) then dispersing fine ~~pure~~ AlN powder in the solution with vigorous agitation to form a suspension, (3) then atomizing the suspension in an inert atmosphere (vacuum, for example) to obtain the

treated powder. Column 3, line 15 through column 4, line 10 and column 5, line 65 through column 6, line 10. The treated powder can contain yttrium oxide in an amount of 0.1 to 10 % by weight of the aluminum nitride. Column 3, lines 5-15. The solvent can be isopropanol (which would be form of propanol). Column 3, lines 45-50.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schultze to use the treated aluminum nitride powder as taught by Knudsen, in order to provide a desirable substrate using a moisture resistant powder, because Schultze teaches the desire to form aluminum nitride articles by plasma spraying aluminum nitride powder, and Knudsen teaches that a desirable moisture resistant aluminum nitride powder can be formed by treating with yttrium oxide precursor. It would have been inherent when plasma spraying such a powder that the oxide precursor would have yielded an oxide, given the high heat of the plasma spraying. It would further have been obvious to modify Schultze in view of Knudsen to use a flame spraying oxyacetylene torch to replace the plasma torch with an expectation of desirable spraying results, because Schultze teaches thermal spraying and it is the Examiner's position that it is well known in the thermal spraying art that plasma and flame spraying with an oxyacetylene torch are both well known desirable methods of thermal spraying. It would further have been obvious to modify Schultze in view of Knudsen to perform routine experimentation to optimize the amount of yttrium oxide content from the range taught by Knudsen of 0.1 to 10% by weight, given the desire to use the best amount for the particular purpose of applicant. It would further have been obvious to modify Schultze in view of Knudsen to use yttrium isopropionate as the oxide precursor, with an expectation of desirable protective results, because Knudsen teaches the

use of yttrium compounds that convert to oxides (column 3, lines 10-20) and it is the Examiner's position that isopropionates are well known oxide precursor compounds in the chemical art.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schultze in view of Knudsen as applied to claims 1-8 and 10 above, and further in view of Okano et al (US 5045365).

Schultze in view of Knudsen teaches all the features of this claim except the cooling of the support by compressed air while spraying. Schultze does teach that the support can be metal. Column 4, lines 20-35. Schultze also teaches cooling the support during spraying. Column 2, line 65 through column 3, line 5 and column 3, line 65 through column 4, line 10.

However, Okano teaches that when coating an article to be thermally sprayed, the conventional method is to spray compressed air on the back of the substrate surface. Column 3, lines 1-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schultze in view of Knudsen to use compressed air for cooling as taught by Okano, in order to provide a desirable cooling of the substrate without having to use liquid, because Schultze teaches the thermal spraying of a cooled support, and Okano teaches that when thermal spraying a cooled support, a conventional well known method of cooling is by compressed air.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:30-4:00) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KATHERINE BAREFORD
PRIMARY EXAMINER